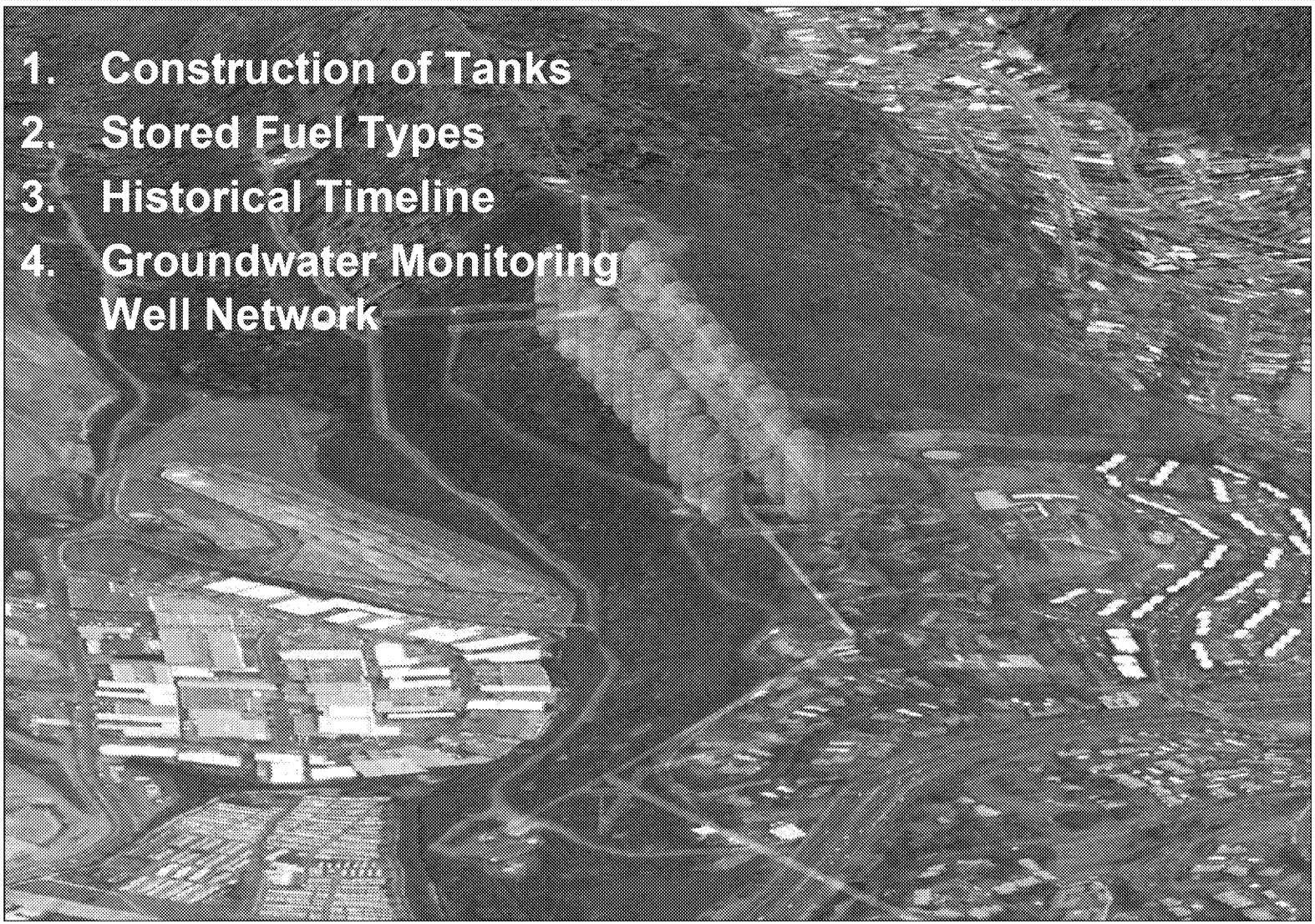
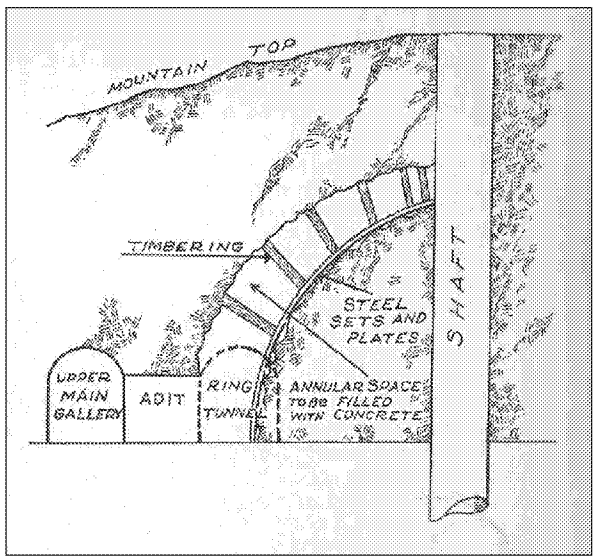
Previous Investigations: Outline

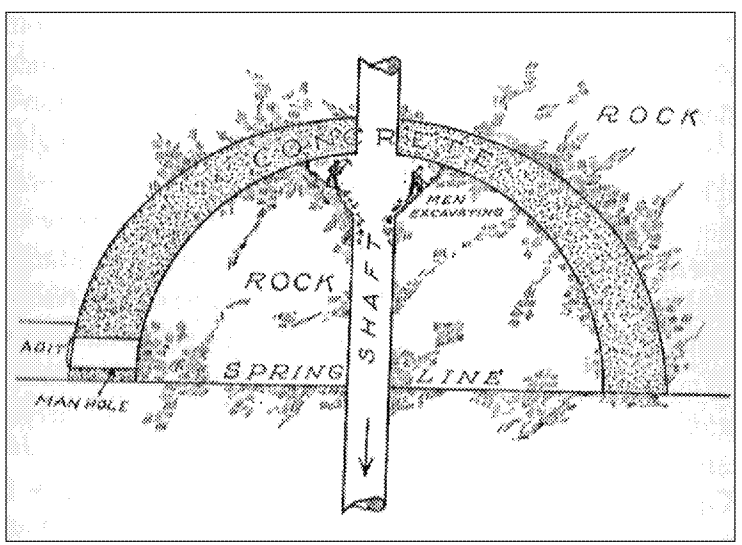


1. Construction of Tanks
2. Stored Fuel Types
3. Historical Timeline
4. Groundwater Monitoring Well Network

Previous Investigations: Construction of Tanks

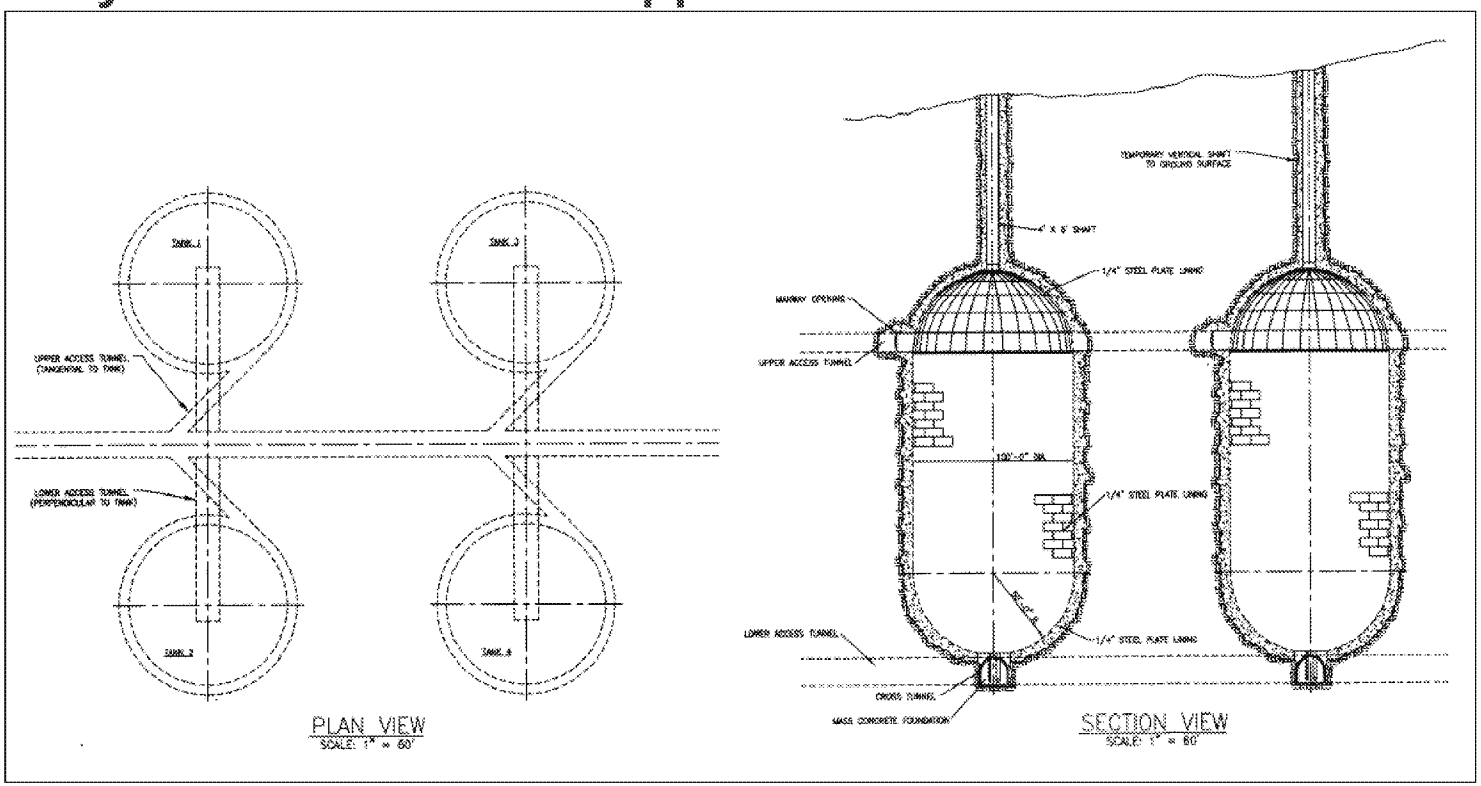
- Before the 1940's, all Navy fuel was stored in aboveground tanks
- For national security reasons, Red Hill fuel farm was installed a minimum of 100 ft underground to protect against aerial attacks
- 20 field constructed steel vertical underground storage tanks (USTs)
  - Inner tank liners constructed of welded steel plates
  - Exterior of steel liner filled with concrete



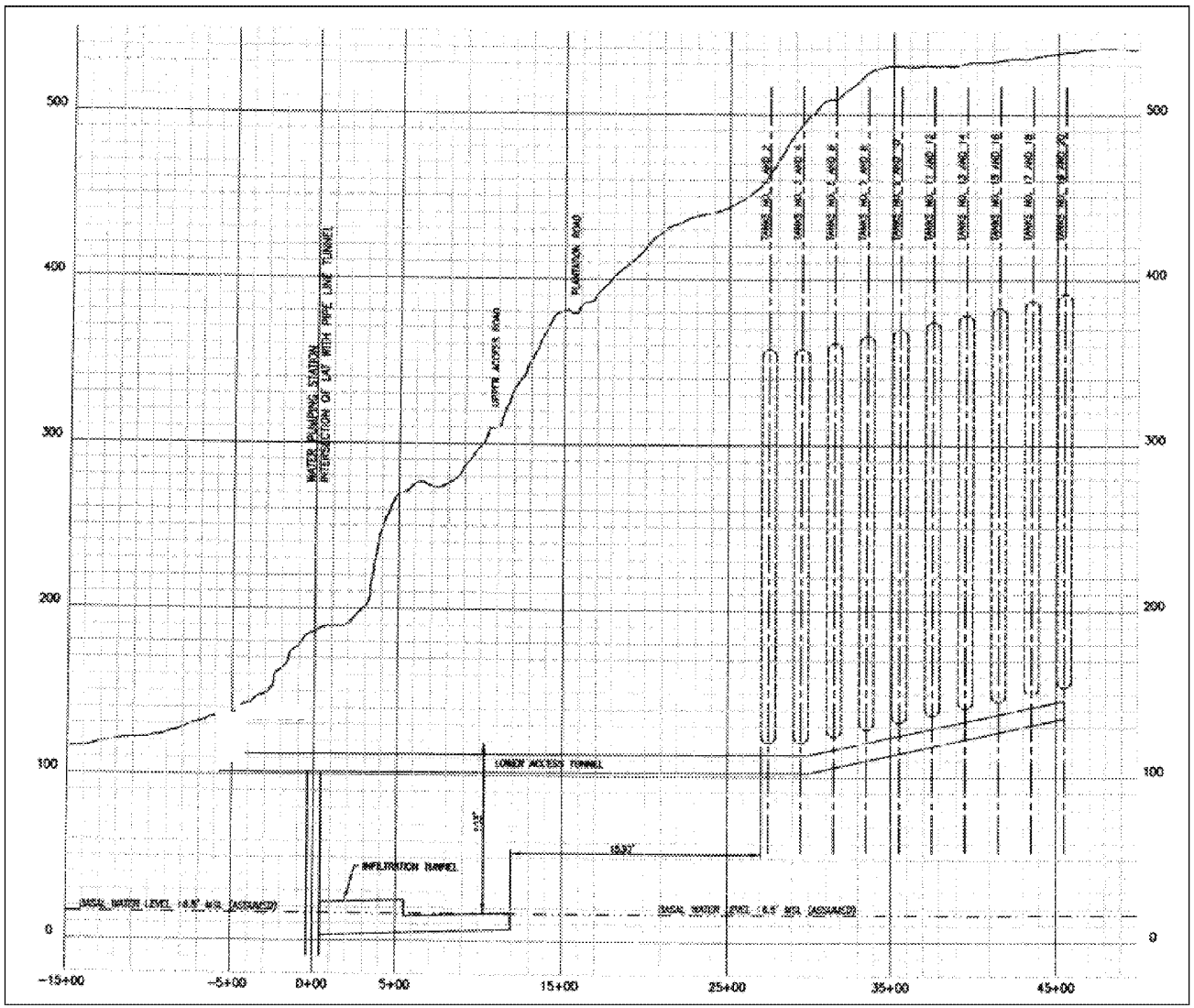


Previous Investigations: Construction of Tanks

- Each tank: 250 ft high x 100 ft diameter, 12.5 million gallons
- Tank tops: at least 100 ft underground
- Tank bottoms: approx. 100 ft or more above groundwater
- Layout: two rows with upper and lower service tunnels



Previous Investigations: Construction of Tanks



Previous Investigations: Fuel Types Stored

Fuel types:

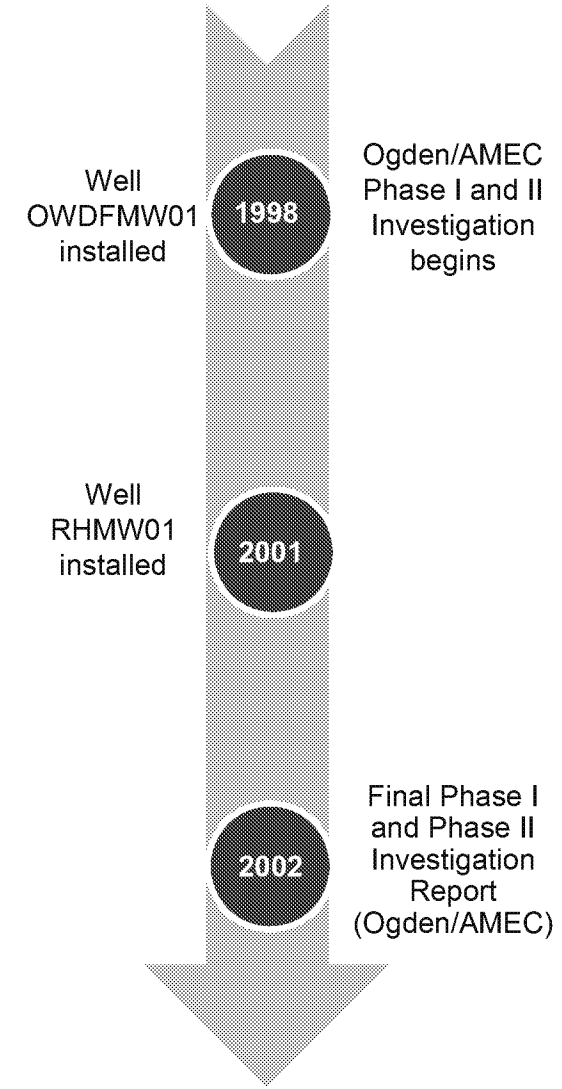
- JP-5 (kerosene-type turbine fuel) – Tank 7-12, 17-18, 20
- JP-8 (kerosene-type turbine fuel) – Tanks 2-6
- F-76 (diesel marine fuel) – Tanks 13-16

Tank Identification	Fuel Type	Status	Capacity
F-1	None	Inactive	12.5 million gallons
F-2	JP-8	Active	12.5 million gallons
F-3	JP-8	Active	12.5 million gallons
F-4	JP-8	Active	12.5 million gallons
F-5	JP-8	Active	12.5 million gallons
F-6	JP-8	Active	12.5 million gallons
F-7	JP-5	Active	12.5 million gallons
F-8	JP-5	Active	12.5 million gallons
F-9	JP-5	Active	12.5 million gallons
F-10	JP-5	Active	12.5 million gallons
F-11	JP-5	Active	12.5 million gallons
F-12	JP-5	Active	12.5 million gallons
F-13	F-76	Active	12.5 million gallons
F-14	F-76	Active	12.5 million gallons
F-15	F-76	Active	12.5 million gallons
F-16	F-76	Active	12.5 million gallons
F-17	JP-5	Active	12.5 million gallons
F-18	JP-5	Active	12.5 million gallons
F-19	None	Inactive	12.5 million gallons
F-20	JP-5	Active	12.5 million gallons

F-76 Marine Diesel Fuel
JP-5 Jet Fuel Propellant-5
JP-8 Jet Fuel Propellant-8

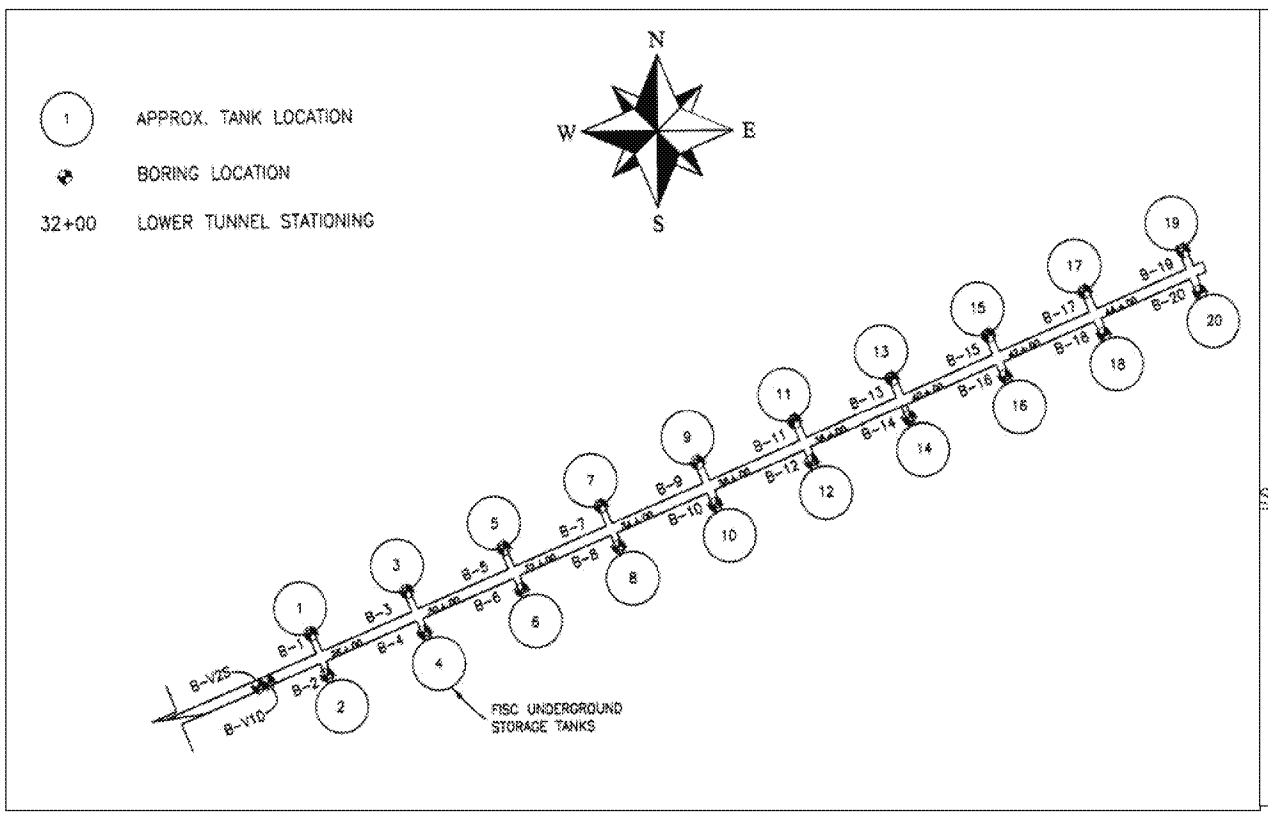
Previous Investigations: Results

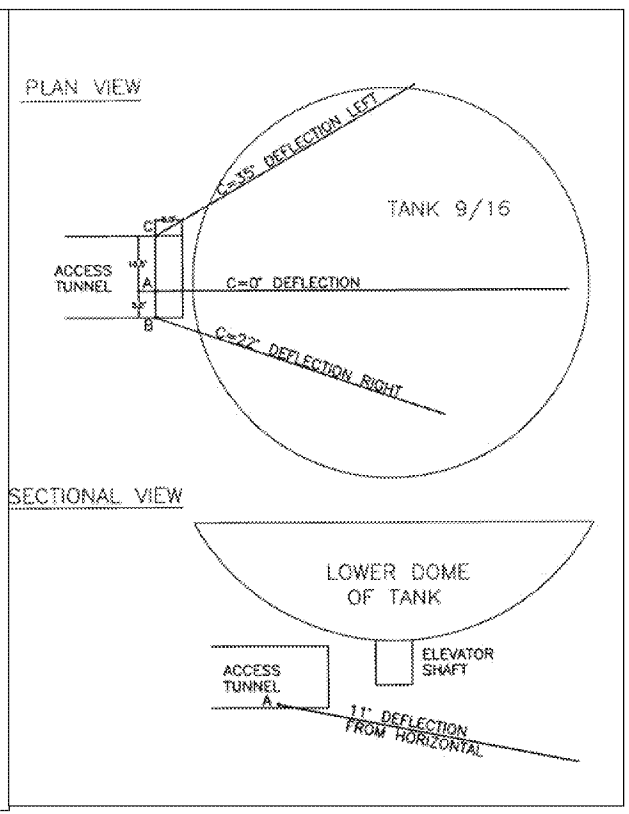
- 1998-2002 – Ogden/AMEC Investigation
  - Conducted to evaluate concerns related to historical releases
  - Included slant boreholes, installation of two monitoring wells
  - Recommended further analysis and risk assessment



Previous Investigations: Results

- 1998 – Ogden/AMEC Investigation (continued)
  - Slant borehole drilled at angle beneath each UST (min. 5 ft below UST), terminated 80-90 ft above groundwater level





Previous Investigations: Results

- **1998 – Ogden/AMEC Investigation (continued)**
  - **Fluids in angled borings and one deep boring were sampled and submitted for fuel fingerprint analysis**
  - **Three types of fluids were present:**
    - LNAPL mixed with drill water (LNAPL)
    - LNAPL mixed with infiltration water (infiltration fluid)
    - One basal groundwater sample did not have product

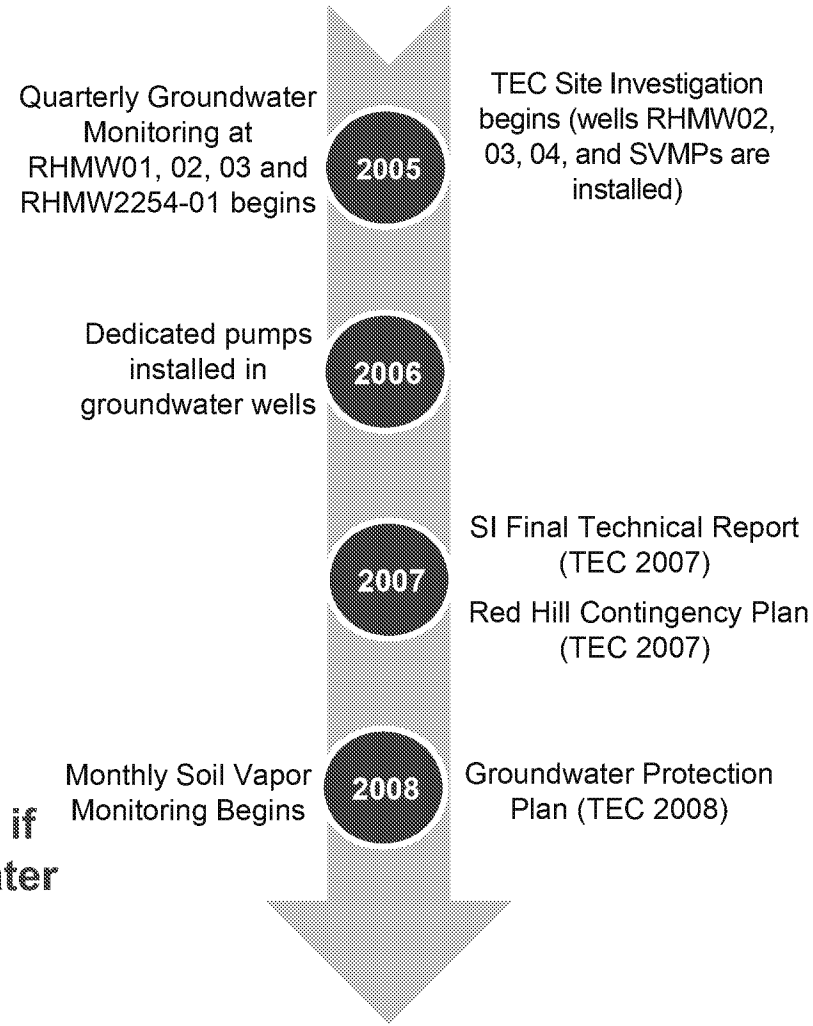
Table 3-4
Summary of Fluid Levels Detected in Monitoring Wells

Monitoring Well ID	Fluid Media	Elevation at Ground Surface	Date	Depth to Fluid Level (ft, POE)	Corrected Elevation of Fluid Level
RH-MW-1	LNAPL	102.66	03/07/01	124.20	70.52
			08/24/01	129.40	69.17
RH-MW-13	LNAPL	121.95	03/07/01	NFD	NA
			08/24/01	132.50	87.66
RH-MW-14	LNAPL	121.75	03/07/01	NFD	NA
			08/24/01	135.30	86.73
RH-MW-17	LNAPL	129.75	03/07/01	NFD	NA
			08/24/01	114.80	103.92
RH-MW-19	Infiltration Fluid	133.68	03/07/01	113.10	104.41
			08/24/01	110.52	108.81
RH-MW-VID	GW	102.56	03/07/01	86.10	16.46
			08/24/01	86.28	16.28

LNAPL - Light phase non aqueous phase liquid (which may be mixed with drill fluid)
ft, POE - feet from boring point of entry
NA - Not applicable
NFD - No fluid detected

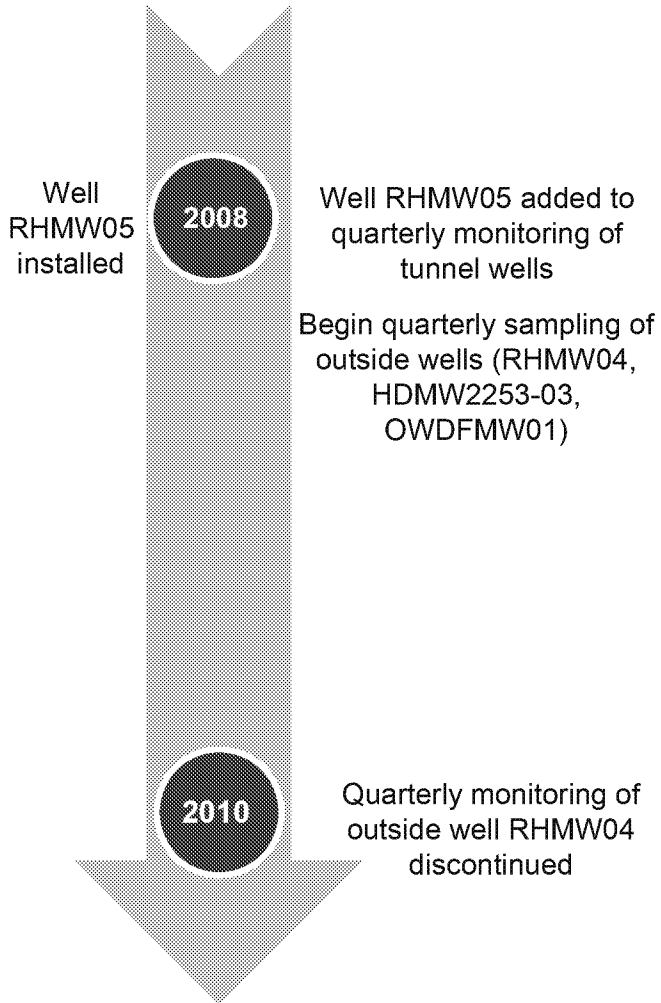
Previous Investigations Results

- 2007 – Site Investigation (TEC 2007)
  - Installed RHMW02, RHMW03, & RHMW04
  - Installed nested SVMPs in 3 slant boreholes
  - Conducted regional pump test
  - Developed MODFLOW flow model
  - Developed RT3D F&T model
  - Concluded VI pathways insignificant due to low volatility of fuels, groundwater depth, and tunnel ventilation
- 2007, 2008 –Contingency & Groundwater Protection Plans
  - Quarterly GWM program and recommended responses to contaminant levels and trends
  - SVM program
  - Maintenance schedule for USTs
  - Actions required to remediate the basal aquifer if a large release of fuel were to migrate to the water table



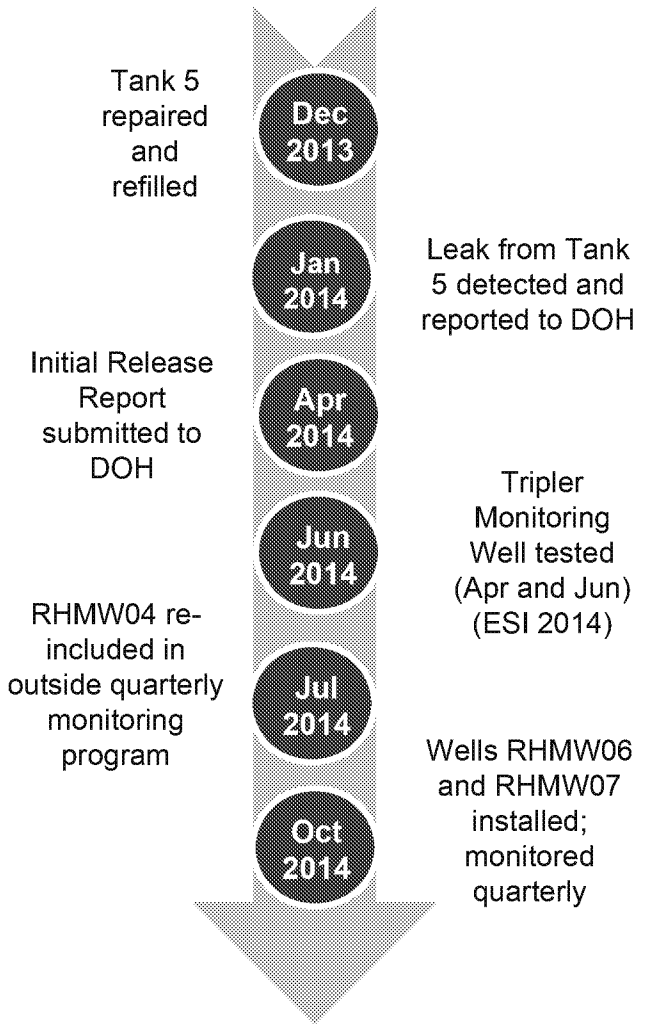
Previous Investigations Results

- **2009 – 2011 Activities Conducted under Groundwater Protection Plan and other DOH UST requirements**
  - **Install RHMW05 (based on modeling results)**
  - **Jan. 2008 – July 2010 Monthly Monitoring:**
    - **Free product well gauging:** No measurable LNAPL
    - **PID Screening of SVMPs:** General trend suggests residual contamination, not a chronic leak
  - **Quarterly groundwater monitoring well sampling**
  - **Re-evaluation of groundwater flow model**

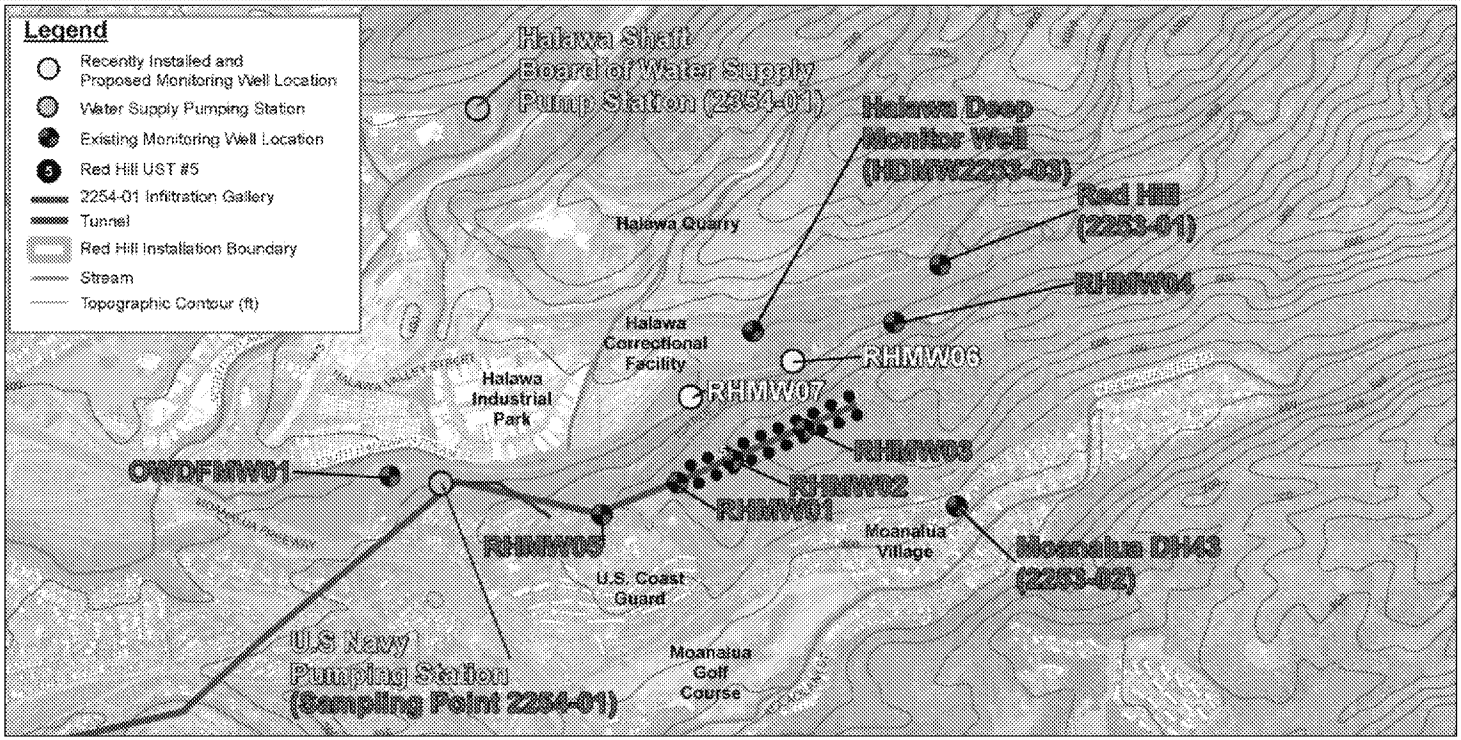


January 2014 Release: Response, Investigations

- Dec. 2013 – Jan. 2014: After repairs, tank 5 was filled with JP-8 fuel in a month-long filling process
- During tank filling, the tank flexed and the fuel level was constantly changing
- Once filled and fuel settled, a release was detected
- Jan. 13, 2014: DOH & NRC immediately notified
- Fuel immediately removed; Tank 5 emptied by Jan. 18, 2014
- April 2014 – Initial Release Response Report
  - Recommended installation of more monitoring wells and further investigation



January 2014 Release: Current Monitoring Well Network



Well Number	RHMW01	RHMW02	RHMW03	RHMW04	RHMW05	RHMW06	RHMW07	RHMW 2254-01	HDMW 2253-03	OWDFMW 01
Description	Down-gradient of Tanks 1-20	Down-gradient of Tanks 7 -20	Down-gradient of Tanks 15-20	Back ground	Sentinel Well	Installed after release (2014)	Installed after release (2014)	Supply water sampling point	BWS monitoring well	Oily Waste Disposal Facility (IR site)